

Application No.: 09/690,600

Case No.: 53434US009

Remarks

Claims 1 to 23 are pending. Claims 1 to 15 and 20 to 23 have been withdrawn from consideration. Claim 16 has been amended.

Support for the amendment to claim 16 can be found at, e.g., page 1, line 28 to page 2, line 1; page 2, lines 17-20; and page 7, lines 4-6. The amendment is believed to place the application in condition for allowance.

§ 102 Rejections

Claims 16-19 stand rejected under 35 USC § 102(b) as purportedly being anticipated by Matsubara et al. (JP 02-23623).

The present invention provides an integrated circuit chip having a passivation surface on which a plurality of conductive bumps are disposed, such that these bumps comprise a metallurgical bond with the integrated circuit chip. Such bond structure can be formed with, e.g., an elevated temperature reflow process (see, e.g., page 1, line 28 to page 2, line; page 2, lines 17-20; and page 7, lines 4-6). The bump material is selected from the group consisting of: solder, meltable solid metals, gold, electroless nickel, electroless gold, and combinations thereof. A layer of adhesive is provided on the bumped side of the integrated circuit chip. The adhesive has a primary surface that is substantially parallel to the passivation surface. The conductive bumps have exposed contact regions that are not covered by the adhesive.

Applicants respectfully submit that Matsubara et al. describe and require pressure welding to form electrical connections between a semiconductor device and a circuit board, which process does not describe, teach, or suggest the structure of a metallurgical bond between the bumps and the chip. Rather, Matsubara describes includes first covering the entire electrode pad surface with an adhesive layer (see, e.g., p. 6 2nd full paragraph), after which conductive particles are “adhered” to the adhesive layer, while the adhesive is still tacky, to form what is referred to as a “bump electrode”. The presence of this adhesive layer fundamentally prohibits the formation of a metallurgical bond between the conductive particles and the underlying electrode pad surface. The conductive particles provide an electrical connection between a semiconductor device and a circuit board when they are pressed together using pressure welding (see p. 4, paragraph 4 to p. 5,

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paragraph 1; and p. 7, paragraph 4). One means of pressing the semiconductor devices against the circuit board is disclosed to be a clip (see p. 7, paragraph 5 to p. 8, paragraph 1 of the translation). The absence any of metallurgical bonds in the invention of Matsubara et al. is acknowledged by their need to incorporate external devices such as clips to maintain electrical connections (see, e.g., p. 7 last 2 paragraphs).

Thus, Matsubara et al. does not describe, teach, or suggest an integrate circuit chip comprising, *inter alia*, a metallurgical bond between a semiconductor device and a conductive bump. For at least these reasons, the rejection of claim 16 under 35 USC § 102(b) as purportedly being anticipated by Matsubara et al has been overcome and should be withdrawn.

Claims 17-19 each add additional features to claim 16. Claim 16 is patentable for at least the reasons stated above. Thus, claims 17-19 are likewise patentable.

As to claim 17, the Examiner asserted that the described structural feature "polished" was a process limitation, without citing any supporting argument or evidence on this record. Applicants note that the polished surface is a characteristic of the adhesive structure in the invention and that the bare assertion by the Patent Office is insufficient to support or maintain this rejection. Thus, the rejection of claim 17 is unwarranted and should be withdrawn.

In summary, the rejection of claims 16-19 under 35 USC § 102(b) as purportedly being anticipated by Matsubara et al is unwarranted and should be withdrawn.

Thus, it is submitted that the application is in condition for allowance. Reconsideration of the application and rejoinder of the withdrawn claims are requested.

Allowance of the pending claims at an early date is solicited.

Respectfully submitted,

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